

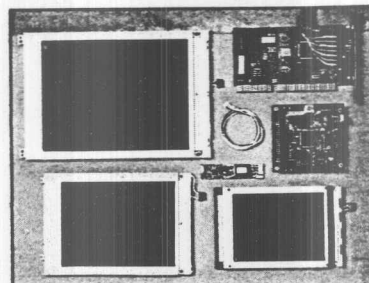


LCDs Use A Single Fixed Voltage

The "B" Series of LCD modules features a high contrast supertwist liquid crystal fluid that allows a single fixed voltage to be used for both contrast and logic. The fluid's voltage stability can eliminate contrast voltage adjustment. APOLLO DISPLAY TECHNOLOGIES INC.

Graphic LCD Kits Are PC Compatible

Designed to produce low-cost prototypes and production systems, Simplicity Kits are available with passive color and monochrome graphic LCDs and PC-compatible ISA or PC/104 bus controllers. Several standard models are available, including VGA (7.5", 9.4" or 10.4") with 648 x 480 resolution and Q-VGA (5.7") with 320 x 240 resolution. All displays are CCFT backlit and include CCFT inverters and cable. All display voltages are generated by the controller. APOLLO DISPLAY TECHNOLOGIES INC., Holtsville, NY. (516) 654-1143; FAX (516) 654-1496



Thank-you For Your Inquiry !!!

With this cover page please find some general, introductory information about the product(s) you inquired about. Additional information and specifications are available on request.

Apollo is the largest **OPTREX** distributor for standard or semi-custom LCD modules and the first *specialist* LCD distributor and value-added distributor of LCD products. Apollo also manufactures our own controller boards and packages display "kits" (LCD, controller, backlight, touchscreens, cables, etc.) for prototype & production applications.

Apollo offers **custom LCD's** and the following value-added operations: attach cables & connectors; apply special anti-glare and other polarizing films for negative image and changing display mode (e.g. reflective to backlit); add special backlights, international character sets, etc.

Please feel free to ***call our display engineers for immediate assistance*** with new designs or second-sourcing of existing designs. We are easy to remember ... call ... **1-800-LCD-STOC(k)**.

Apollo Display Technologies, Inc.

P.S. A recent new product has been very popular ... a **serial RS-232** interface to the character displays! Call for more details!



LCD FEATURES BRIGHT CHARACTERS

Offers Low-Cost, High Contrast and Wide Viewing Angle

Apollo Display Technologies, Inc. has introduced a line of backlit, supertwist LCD modules featuring bright characters on a dark back-ground. These *negative image* displays are value-added by Apollo from standard, *positive image OPTREX* displays. Legibility was designed to simulate that offered by light generating displays (ex. VF, LED, etc.) but with the lower cost and lower power consumption of LCD's.

The negative image of the display is formed when a pixel switches between it's normally opaque state when unselected and it's clear state when selected, essentially acting as a light "shutter" for the backlighting. Several types of backlighting are available, including LED, electroluminescent, cold-cathode and fiber optic. The most popular is the yellow-green LED backlight due to it's high brightness, high efficiency and 50,000+ hour life.

Standard Parts:

C x R	Model #	Char Size	Module Dimensions
16 x 2	DMC16202NY-LY-1-APN	5.55 mm	84.0 x 45.0 x 15.1 mm
16 x 2	DMC16230NY-LY-B-APN	9.66 mm	122.0 x 44.0 x 14.6 mm
20 x 2	DMC20261ANY-LY-B-APN	5.55 mm	116.0 x 37.0 x 15.7 mm
20 x 2	DMC20203NY-LY-B-APN	9.22 mm	146.0 x 43.0 x 14.0 mm
20 x 4	DMC20481NY-LY-B-APN	4.75 mm	98.5 x 61.0 x 15.6 mm
24 x 2	DMC2074NY-LY-B-APN	5.55 mm	121.5 x 33.5 x 16.1 mm
40 x 2	DMC40267NB-LY-B-8-A	5.55 mm	182.0 x 34.5 x 15.1 mm
40 x 4	DMC40457NY-LY-B-APN	4.89 mm	190.0 x 54.0 x 10.0 mm

If you don't see what you needjust ask!! We may be able to make it!! Prices for samples start at \$20.00 with sample delivery typically 2-4 weeks after order. For further technical information and quotations for quantities from 1 ~ 10,000 units, East Coast customers please call New York @ **1-800-LCD-STOC(k)** and West Coast customers please call California @ **1-888-4LCD-WES(t)**.

Apollo is the largest, nationally franchised *Optrex* standard product distributor and value-added distributor. We sell the full line of *Optrex* character and graphic displays stand-alone or with Apollo controllers, controller boards, backlight inverters, contrast voltage converters, cable assemblies and kits.

Please call us for all your LCD needs!! Thank-you for your inquiry!!

Apollo Display Technologies, Inc.
June, 1997

CDSxxxC: RS232 SERIAL CONTROLLER FOR CHARACTER LCD'S

- * Accepts RS-232, RS-422 and 20ma current loop ASCII- formatted data.
- * Jumper selectable data rates of 300, 1200, 2400, and 9600 baud.
- * Selectable data and parity formats, self test and diagnostic modes.
- * Opto-Isolated input circuit for noise rejection.
- * Low power consumption, requires only +5VDC input.
- * Can interface with dual controller displays or with two single controller displays.

The CDSxxxC serial interface board is sold by Apollo in combination with an OPTREX LCD module. The OPTREX LCD can be matched with the appropriate controller board by an Apollo application engineer. As OPTREX's largest US distributor and value added manufacturer, Apollo can meet your serial (or parallel) LCD requirements competitively and with full technical support.

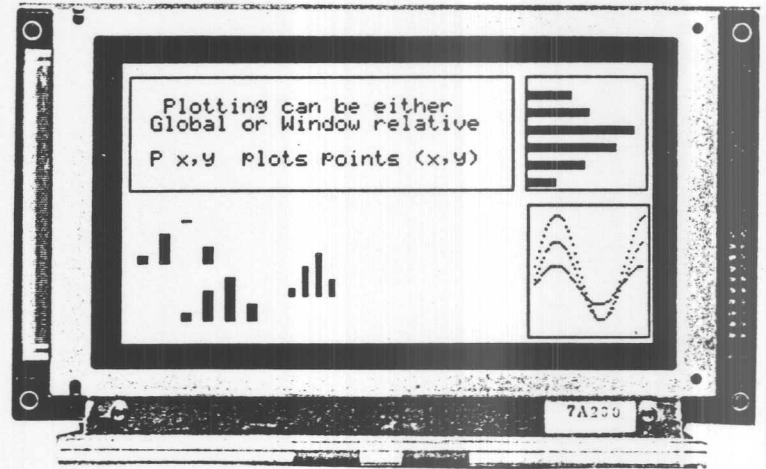
The CDSxxxC accepts serial data at one of four jumper selectable baud rates, at RS232-C, RS422A or 20ma current loop levels. Data word arrangements, including parity are also selectable. The parallel output is TTL compatible CMOS. The output connector (J2) connects directly to the OPTREX display or any other display using the Hitachi HD44780 compatible controller.

Two display controllers can be individually addressed using the two enable outputs. This allows the CDSxxxC to interface with the displays having two controllers, such as the OPTREX DMC40457. It can also be connected to two single controller displays by connecting the enable 1 output to the first displays enable input and the enable 2 output to the second displays enable input.

The board also features an opto-isolated input circuit for noise reduction, a -20 to +70 C operating temperature range, parity and rate error detection, system diagnostic and self test modes, hardware reset, and an LED to indicate when data is being received.

Apollo Display Technologies is a technical, stocking, value added franchised distributor of OPTREX LCD Modules. Standard and semi-custom modules are available in both character and graphic types, from one line of 16 characters up to SVGA (800x600) color graphic displays. We also manufacture a full line of quality, low cost controller boards available in ISA, PCI, CPU/MPU and PC/104 formats. Touch screens, touch screen controllers and cables are available to satisfy all of your application needs.

Apollo Display Technologies Inc.
194-22 Morris Ave. Holtsville, NY 11742
Phone: (516) 654-1143 Fax: (516) 654-1496



LCD FEATURES SMART GRAPHICS CONTROLLER

Low-Cost Parallel & Serial I/O With High Level Commands

Apollo Display Technologies, Inc. has introduced a line of instrument size LCD modules for OEM's featuring a smart LCD "windows" controller providing high level commands to simplify graphics programming. The low cost CDSxyG controller allows simple 8-bit parallel or serial interface (RS232 protocol) to mid-size graphics LCDs with up to 240x128 resolution.

The CDSxyG controller features:

- * Up to 40 characters x 16 rows
- * Up to 240 x 128 pixel graphics
- * 5 x 7 built-in character font
- * User definable font selection
- * Parallel input, simple interface
- * Serial input channel (RS232)
- * Up to 8 "soft" keys
- * 4 x 4 key scan of soft keys
- * 256 built-in windows
- * Any number user-defined windows
- * Bargraphs automatically sized to windows
- * Pixel plotting is global or window relative
- * Large characters user-defined
- * Automatic window cursor management
- * Wrap or scroll text in windows
- * Vertical or horizontal scroll in windows

Standard displays available include resolutions of 240x128, 240x 64, 160x128 and 128x128. Each resolution has the user option of LED, CCFT or EL backlighting, blue or black & white supertwist technology, commercial or extended temperature fluids and office (transmissive) or sunlight (transflective) readability.

Prices in 1000-unit quantities for a 240x64 supertwist, reflective display are a) \$52.00, b) \$74.00, or c) \$142.00 depending on controller option selected. Options include: a) the display with standard on-display controller (T6963C) & RAM; or b) the display plus the high level controller (CY325B) in 40-pin DIP or PLCC package to be put on the customer's board; or c) the display plus an integrated controller board (CDSxyG) with the CY325B controller, Vee circuit, etc. attached to the display.

Apollo is *OPTREX*'s largest US distributor, value-added distributor and controller manufacturer. For further information on this product or any other LCD question please contact: Apollo Display Technologies, Inc., 194-22 Morris Ave., Holtsville, NY 11742; ph: (516)654-1143; fax: (516)654-1496.

GRAPHIC LCD'S FEATURE LONG-LIFE LED BACKLIGHTING

Popular Sizes Suited for Benchtop, Rackmount and Portable Instruments

Holtsville, NY: Apollo Display Technologies, Inc. introduced four graphic *Optrex* LCD modules featuring LED backlighting with significantly longer life characteristics than cold cathode fluorescent (CCFT) or electroluminescent (EL) backlighting. These new modules offer the standard pixel resolutions of the most popular sub-VGA displays and were specially designed for benchtop, rackmount and portable instrumentation.

Typical lifetimes of CCFT backlighting is 10,000 to 20,000 hours and EL backlighting is 2,500 to 5,000 hours. However LED backlighting offers an average life of 100,000 hours, extending the useful life of benchtop and rackmount instrumentation where backlighting is often required to be on at all times. For handheld terminals and portable instrumentation, these LED backlit modules were designed with positive image film orientation to improve readability in direct sunlight and do not require space limiting DC to AC inverters.

Part #	Resolution	Outline Dimensions	On-Board/Type Controller	Comments	Sample Price
DMF50427NYJ-LY	128x64	75x52.7x8.5mm	Yes/HD61202	Low Current Transflective	\$ 50.00
DMF5001NY-LY	160x128	129x102x19.22mm	Yes/T6963C		\$ 130.00
DMF5005NY-LY	240x64	180x65x12mm	Yes/T6963C		\$ 100.00
DMF5005NYJ-LY	240x64	180x65x12mm	Yes/T6963C	Op. Temp. -20 to 60 C	\$ 115.00
DMF50417NY-LY	320x240	139x100x13.2mm	No	Controller Board Available	\$ 120.00
NEW... DMF50773NF-SLY	240x128	170x95x16.7	Yes/T6963C	B&W High Contrast	\$115.00

Note: Apollo also sells a full line of graphic displays with CCFT and EL backlighting. CCFT backlighting offers very bright, white light but a shorter life than LED's. EL backlighting offers white light for dim ambient lighting conditions and has low current draw for battery operation but it also has shorter life. Therefore, backlighting is decided based on application-specific requirements.

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